CLAIMS

What is claimed is:

1. A method of manufacturing a hydrodynamic torque converter of the type comprising a pump wheel and a turbine wheel, each said wheel comprising an outer shell, an inner shell, and a plurality of vanes connecting said shells, each said vane having edges facing said shells, said method comprising:

providing a vane plate for each said vane; and

removing material from said vane plate to create open areas surrounding a vane in the vane plate.

2. A method as in claim 1 wherein said open areas lie within a plate frame which is connected to the vane by holding fins.

3. A method as in claim 2 wherein each said vane comprises a curved zone and a flat zone separated by a neutral line, said holding fins being linearly aligned with said neutral line.

4. A method as in claim 1 further comprising providing each said vane with connecting elements for reception in openings in said shells for connecting said vanes to said shells, each said connecting element having a root which is connected to an adjacent said edge by a transition, at at least one said transition being formed as a relief notch having a transition radius between said edge and said connecting element.

5. A method as in claim 4 wherein said relief notch is fabricated without a cutting burr.

6. A method as in claim 4 wherein said vane has a curved zone adjacent to one of said connecting elements having a root connected to said edge by said at least one transition, said one of said connecting elements being flat.

7. A method as in claim 1 wherein said vane has a leading flow edge and a trailing flow edge, said method further comprising pressing said vane plate to smooth the surface of the vane at least one of said leading flow edge and said trailing flow edge.

8. A method as in claim 2 further comprising separating said vane from said plate frame and said holding fins by an industrial separating operation.

9. A method as in claim 1 further comprising cutting said vane plates from a strip material.

10. A method as in claim 1 wherein said vane plate comprises a metal substrate having a coating on at least one side.

11. A method as in claim 10 wherein the coating on at least one side of the vane plate is copper plating.

12. A hydrodynamic torque converter of the type comprising a pump wheel and a turbine wheel, each said wheel comprising an outer shell, an inner shell, and a plurality of vanes connecting said shells, each said vane comprising:

an inner edge facing said inner shell;

an outer edge facing said outer shell;

a leading flow edge connecting said inner and outer edges;

a trailing flow edge connecting said inner and outer edges;

a curved zone having a first plane of curvature and extending from said trailing flow edge toward said leading flow edge; and

a flat zone extending from said curved zone to said leading flow edge.

13. A hydrodynamic torque converter as in claim 12 wherein said curved zone has a second plane of curvature along the trailing flow edge.

14. A hydrodynamic toque converter as in claim 12 wherein each said vane has a smooth pressed surface along said trailing flow edge.

15. A hydrodynamic torque converter as in claim 12 wherein each said vane has a smooth pressed surface along said leading flow edge.

16. A hydrodynamic toque converter as in claim 12 wherein each said vane has a chamfer at at least one of said leading flow edge and said trailing flow edge.

17. A hydrodynamic torque converter of the type comprising a pump wheel and a turbine wheel, each said wheel comprising an outer shell, an inner shell, and a plurality of vanes connecting the shells, each said vane comprising an inner edge facing said inner shell and an outer edge facing said outer shell, each said shell having at least one opening with a length and a rear surface facing away from the vanes, each said vane of at least the turbine wheel comprising:

a plurality of connecting elements on said edges, said elements being received through respective openings in the shells and deformed against the rear surfaces of the shells to fasten the vanes to the shells, each said connecting element having a root which is connected to an adjacent said edge by a transition, at least one said transition being formed as a relief notch having a transition radius between said edge and said connecting element.

18. A hydrodynamic torque converter as in claim 18 wherein said relief notch is fabricated without a cutting burr.

19. A hydrodynamic torque converter as in claim 18 wherein each said vane has a curved zone, said relief notch leveling out differences between the curved zone and the connecting element.